

## Pars Plana Vitrectomy with and Without Silicone Oil Tamponade in Treatment of Infectious Endophthalmitis in Terms of Final Visual Acuity

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### Abstract

### Original Research Article

**Objectives:** To compare clinical outcome of Pars Plana Vitrectomy (PPV) and Pars Plana Vitrectomy with Silicone oil tamponade in treatment of infectious endophthalmitis in terms of final Visual acuity. **Material and methods:** A hospital based prospective interventional study was conducted among 84 patients of infectious endophthalmitis who were randomly divided into two groups -Group A – Pars plana Vitrectomy alone (PPV group) and Group B - pars plana vitrectomy with silicone oil tamponade (PPV+SOI group). **Results:** Significantly higher proportion of the cases were observed with visual acuity 6/60 & better LogMAR 1.0 in PPV+ SOI (N=42) group (76.19%) as compared to PPV alone (N=42) 47.62% (P=0.013). Cases with visual acuity 6/18 & better LogMAR 0.48, were more in PPV+ SOI (52.38%) group as compared to PPV alone group (16.67%) (P=0.001). Retinal Detachment were significantly present in PPV alone group 14.29%. **Conclusion:** Pars plana vitrectomy with silicone oil tamponade (PPV + SOI) have significantly better final visual acuity as compared to Pars plana Vitrectomy alone (PPV).

**Keywords:** Pars plana Vitrectomy, silicone oil tamponade, Infectious Endophthalmitis, LogMAR, Visual acuity.

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## INTRODUCTION

Endophthalmitis; a purulent inflammation of intraocular fluids vitreous and aqueous, is one of the most serious complications of intraocular surgery and has a very poor prognosis if left untreated [1-3]. Among the various types, acute postoperative endophthalmitis is the most common form with highest risk after secondary IOL (0.2-0.367%) and lowest after pars plana vitrectomy (0.03-0.046%). The incidence of endophthalmitis after cataract surgery varies according to the surgical technique, but in recent large series, it has ranged from 0.02% to 0.09% [4-9].

The treatment of endophthalmitis has historically involved multiple routes of antibiotic administration, including intra vitreal, systemic, topical, and subconjunctival [10]. With advent of pars plana Vitrectomy (PPV) techniques, vitrectomy combined with injection of intravitreal antibiotics became the standard treatment for virtually all forms of endophthalmitis. Though this technique remove the offensive microorganisms and most of the cellular debris, the retina may continue to be damaged by the remaining inflammatory debris and may results in retinal detachment resulting in poor visual outcome [11].

In endophthalmitis, among patients with a visual acuity of light perception, early PPV had better prognosis [12, 13]. PPV results in debulking of offending organism, removal of cellular debris and attenuation of risk of retinal detachment [14, 15]. The use of PPV with silicone oil tamponade has resulted in better stabilization of the retina and control of infection in such cases resulting in superior postoperative outcome [14-18].

Indian data in this context are lacking. Therefore, this study was to compare clinical outcome of Pars Plana Vitrectomy (PPV) and Pars Plana Vitrectomy with Silicone oil tamponade (PPV + SOI) in treatment of infectious endophthalmitis in terms of final Visual acuity.

## MATERIALS & METHODS

This hospital based prospective randomized interventional study was conducted during one calendar year among patients attending ophthalmology OPD at Medical College in Western India after permission of institutional ethics committee. All patients had infectious endophthalmitis (presentation within two weeks in post

perative endophthalmitis and all post traumatic endophthalmitis) with vision perception of light and more. Patients with no perception of light, corneal dystrophy, corneal degeneration, optic atrophy and pregnant female were excluded from the study. Total 84 eyes of 84 patients were included in the study after written informed consent of the study participants. All 84 cases were randomized by simple random sampling in two groups- pars plana vitrectomy alone (PPV) (Group I) and pars plana vitrectomy with silicone oil tamponade (PPV+SOI) (Group II).

All patients were admitted to hospital at least one day before surgery for routine preoperative investigations. This was a blinded study as operating surgeon and the person collecting study data were different. All surgeries were performed by a single surgeon in this study.

### Surgical Technique

In group I, all patients underwent a standard 3 port 23 gauge Pars plana Vitrectomy using a non contact wide angle viewing system combined with an image inverter. We did anterior chamber wash +23G pars plana vitrectomy + fluid air exchange+ endolaser of suspicious area/ breaks/foreign body impaction site+ intravitreal injection of vancomycin 1mg /0.1cc, ceftazidime 2.25mg/0.1cc and in case of vegetative matter injury voriconazole 50microgram/0.1cc done in pars plan vitrectomy group.

In group II, silicone oil injected manually in vitreous cavity of all patients after PPV performed as in group I. In aphakic silicone oil filled eyes, a prophylactic six o'clock iridectomy was performed before the closure.

Modification in the dose of intravitreal antibiotics were done as required in eyes with silicone oil to account for the reduction in vitreous fluid. Half dose of intravitreal antibiotics were injected.

Post operatively antibiotics, steroids and drugs to prevent rise in IOP were given to all patients. When

culture results became available; the antibiotics according to the organism and drug sensitivity were given.

Follow up was done at day 1, day 7, 28 days, 2 months, 3 months, 6 months for BCVA, IOP or any other complications. Silicone Oil removal was done after 2- 3 months.

### STATISTICAL ANALYSIS

Microsoft Excel® and SPSS® 17.0 for Windows® were used for data storage and analysis. Continuous variables were expressed as mean ± standard deviation. Student's t test and Chi-Square test were used to determine statistical difference between variables. Statistical significance was set at P value ≤ 0.05.

### RESULTS

All 84 patients of infectious endophthalmitis were randomly assigned in 2 groups- Group I (Pars plana Vitrectomy alone, PPA) and Group II (pars plana vitrectomy with silicone oil tamponade, PPA+SOI).

Both the groups were comparable in terms of age of cases, duration of symptoms and male: female ratio (P>0.05). The mode of injury (Post operative or post traumatic) also had no significant difference in both the groups (P>0.05) (Table No.1).

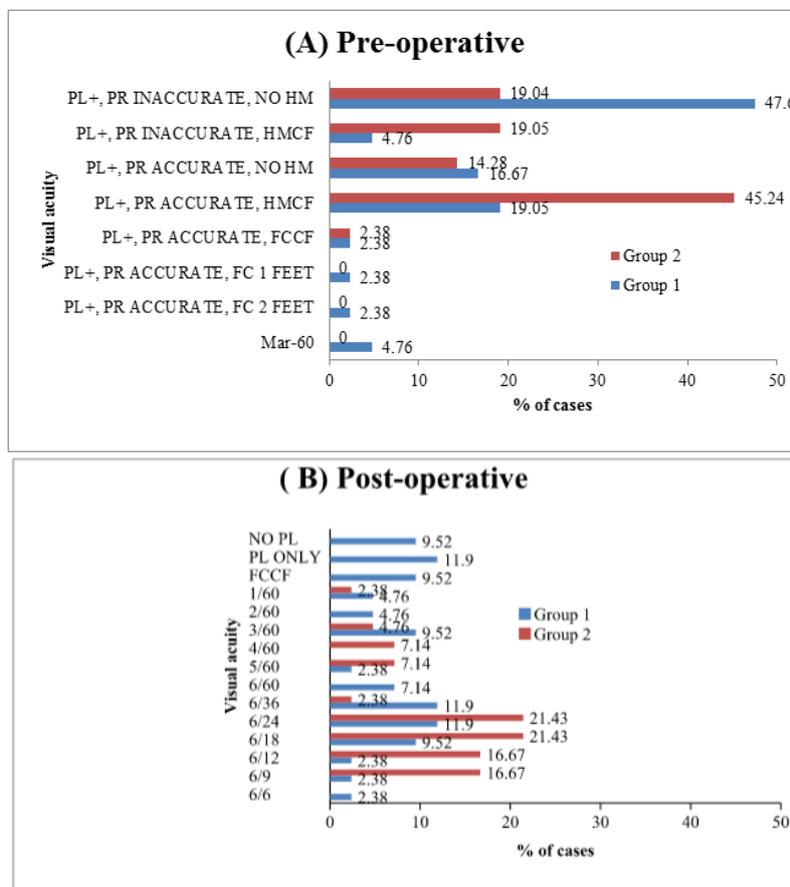
No significant difference was observed in terms of perception of light and Phthisis bulbi among both groups (>0.05). Retinal detachment was observed in only group I (14.29%). In group II, significantly higher proportion of the cases had observed visual acuity 6/60 & better LogMAR 1.0 (76.19%) as compared to group I (47.62%) (P = 0.013). Similarly in group II, significantly higher proportion of the cases had observed visual acuity 6/18 & better LogMAR 0.48 (52.38%) as compared to group I (16.67%) (P=0.001). The post operative LogMAR was also significantly better in group II (0.58± 0.39) compared to group I (0.89± 0.42) (P 0.001) (Table No.2).

**Table-1: Characteristics of study participants**

	Total N (%)	Group I (PPV) N (%)	Group II (PPV+SOI) N (%)	P	Sig
Age (years)	37.75±22.44	39.55±24.06	35.95±20.83	>0.05	NS
Duration of Symptoms (Days)	7.79± 4.90	8.02± 5.76	7.55 ± 3.91	>0.05	NS
Male	56 (66.67)	30 (71.43)	26 (61.90)	>0.05	NS
Type	Post-operative	20 (47.62)	13 (30.95)	>0.05	NS
	Post-traumatic	51 (60.71)	22 (52.38)		
Presenting symptoms					
Diminution of vision	82 (97.62)	41 (97.62)	41 (97.62)	>0.05	NS
Pain	75 (89.29)	34 (80.95)	41 (97.62)	>0.05	NS
Redness	55 (65.48)	28 (66.67)	27 (64.29)	>0.05	NS
Watering	7 (8.33)	5 (11.90)	2 (4.76)	>0.05	NS
Media Haze	84 (100.00)	42 (100.00)	42 (100.00)	>0.05	NS
Hypopyon	81 (96.43)	41 (97.62)	40 (95.24)	>0.05	NS

**Table-2: Distribution of the cases according to complications and Best Corrected final Visual Outcome (at 6 months)**

		Total (N=84)		Group 1 (N=42)		Group 2 (N=42)		P	Sig
		No.	%	No.	%	No.	%		
Complications	Absent	67	79.76	28	66.67	39	92.86	0.007	Sig
	Present	17	20.24	14	33.33	3	7.14		
ERM		1	1.19	0	0.00	1	2.38		
Macular Scar		2	2.38	1	2.38	1	2.38	>0.05	NS
Phthisis Bulbi		3	3.57	3	7.14	0	0.00		
Reinfection		3	3.57	3	7.14	0	0.00		
Retinal Detachment		6	7.14	6	14.29	0	0.00		
Subretinal Gliosis		1	1.19	0	0.00	1	2.38		
Uncontrolled Infection		1	1.19	1	2.38	0	0.00		
No perception of Light		4	4.76	4	9.52	0	0.00	>0.05	NS
Vision 6/60 & better LogMAR1.0		52	61.90	20	47.62	32	76.19	0.013	Sig
Vision 6/18 & better LogMAR 0.48		29	34.52	7	16.67	22	52.38	0.001	Sig
Post operative Log MAR		0.71± 0.42		0.89± 0.42		0.58± 0.39		0.001	Sig



**Fig-1: Distribution of the Cases According to best corrected Visual Acuity (A) pre-operative, (B) post-operative at 6 months**

**DISCUSSION**

The outcome of endophthalmitis depends on surgical technique. The Endophthalmitis Vitrectomy Study (EVS) recommended vitrectomy only in cases with visual acuity of light perception (LP) only [12]. Later on researchers observed better visual outcomes with broader use of a full vitrectomy in postoperative endophthalmitis cases, including those presenting with better than LP visual acuity[11, 12].

In our study the clinical outcome of Pars Plana Vitrectomy (PPV) and Pars Plana Vitrectomy with Silicone oil tamponade (PPV + SOI) in treatment of infectious endophthalmitis was studied in terms of final Visual acuity.

The Pars Plana Vitrectomy with Silicone oil tamponade (PPV + SOI) resulted in better clinical outcome (BCVA) compared to Pars Plana Vitrectomy

(PPV) alone in our study. Similar observation was made in previous studies [15].

The complications including retinal detachment and reinfection were more frequent in Pars Plana Vitrectomy (PPV) group compared to Pars Plana Vitrectomy with Silicone oil tamponade (PPV + SOI) indicating that Silicone oil tamponade along with PPV resulted in lesser complications.

The Pars Plana Vitrectomy helps in removal of offending organism and inflammatory debris but on the other hand it decreases space in posterior chamber [14, 15].

The risk of retinal detachment is high in cases with endophthalmitis[12,19]. This is due to the traction bands formation by inflammatory exudates and hypotonia due to vitrectomy. The use of silicon oil tamponade had resulted in better outcome with less frequent retinal detachment in previous studies [12, 15, 18, 19]. In our study also no case had retinal detachment when treated with silicon oil tamponade. The Silicone oil tamponade along with vitrectomy helps in restoration of posterior chamber cavity thus lessen the risk of hypotonia and retinal detachment. Silicon oil also had inhibitory effect on microbial flora and helps in settle down the ongoing infection [20]. It also creates an optically clear medium which helps in better post-operative evaluation [15, 16]. In our study only complication found with silicone oil filled eye was increased intraocular pressure (4/42 patients, 9.52%) which were managed with topical antiglaucoma drugs and one patient who was not responsive to topical antiglaucoma drugs undergone oil tap. Patient having well settled retina underwent silicone oil removal after 2 or 3 months postoperative.

## LIMITATIONS

The small sample size was a major limitation of our study. This was a single center study so the results may not imply a general case, and further studies with a larger sample size are needed.

## CONCLUSION

Pars plana vitrectomy with silicone oil tamponade had significantly better final visual acuity than pars plana vitrectomy alone. Postoperative complications were also significantly low in pars plana vitrectomy with silicone oil tamponade compared to pars plana vitrectomy alone.

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